REMARKS

In response to the final Office Action mailed on October 26, 2009 ("Final Office Action"), having a period for response set to expire on January 26, 2010, Applicants respectfully request that the Office favorably consider the following remarks.

I. Status of the Claims and Summary of the Final Office Action

A. Status of the Claims

Upon entry of this amendment, claims 1, 3, 4, 6-10, 14-16, 18-23, and 27-75 are pending. Applicants have amended claims 1, 6-10, 16, 18, and 23, and have canceled claims 2, 5, 11-13, 17, and 24-26. Applicants have added new claims 73-75. Claims 53-72 were withdrawn from consideration by the Office pursuant to a Requirement for Restriction.

Claim 1 has been amended to recite that the claimed particle dimensions range from 10 nm to 35 nm or 0.5 μm to 10 μm. Similarly, dependent claims 6-10, 16, 18, and 23 have been amended to comport with the amended ranges of claim 1. Dependent claims 73-75 have been added as claims reciting dimensions within the amended 0.5 μm to 10 μm range.

The amendments to claims 1, 6-10, 16, 18, and 23, and the addition of dependent claims 73-75 do not introduce any new matter. Support for these claimed ranges can be found at paragraphs 93 and 95 of the specification, and original claims 5-9, 12, 13, et al.

B. Summary of the Final Office Action

In the Final Office Action, the Office rejected claims 1, 3-4, 6-23 and 27-52 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,583,882 ("Bartrug") in

view of U.S. Patent No. 4,440,881 ("Girgis"). In response, Applicants respectfully disagree with and traverse this rejection for at least the following reasons.

II. Response to the 35 U.S.C. § 103(a) Claim Rejection

The Office admitted that "Bartrug does not teach the average dimension of the particles in his latex." (Final Office Action at 3.) Lacking support in Bartrug, the Office relied on Girgis for a teaching of particle size. The Office stated that (1) Girgis "teaches that the particle size of the elastomeric latex must be less than 2000 angstroms (0.2μm; 200nm)" and that (2) Girgis's "butadiene-vinyl pyridine-styrene terpolymer . . . has a particle size of 1100 angstroms (0.11μm; 110nm), which is within the instant claimed range." (*Id.* at 3 (citing column 10, lines 18-29 of Girgis).) Further, the Office combined Bartrug and Girgis, finding that Bartrug and Girgis are analogous art, and consequently stated that it would have been obvious to use a commercially available latex "having a low average particle size, with the reasonable expectation of success of forming glass strands having improved flexibility and improved fatigued resistance." (*Id.* at 4 (emphasis added); *see also id.* at 8.) Notably, the Office also found that "a limitation with respect to the size of an article, such as the particle size, is not ordinarily a matter of invention." (*Id.* at 4 (citing *In re Rose*, 105 USPQ 237 (C.C.P.A. 1955).)

Applicants respectfully disagree with the Office's characterizations of Girgis and the finding that the claimed particle sizes are not a matter of invention.

A. Girgis Teaches Away from the Claimed Particle Dimensions

Girgis teaches away from any particle sizes above 200 nm. The Office admitted this, noting that Girgis teaches that the particle size of the elastomeric latex "must be less than 2000 angstroms (0.2μm; 200nm)." (Final Office Action at 4-5; *id.* at 8.)

Indeed, Girgis explicitly states that "the particle size of the non-selfcross-linkable elastomeric latex must be less than 2000 Angstroms and preferably from about 500 to about 1700 Angstroms." (Girgis, col. 8, lines 23 to 26 (emphasis added).) Accordingly, because Girgis *teaches away* from any particle sizes above 2000 Angstroms, Girgis cannot be combined with Bartrug to render obvious coated strands with particle sizes above 2000 Angstroms. Thus, Applicants submit that pending claims reciting particle sizes of 0.5 μm to 10 μm are in allowable form over Bartrug in view of Girgis.

In addition, Girgis does not fairly suggest a range of particles lower than 50 nm. (*Id.* at col. 8, lines 23-26.) Indeed, the examples and descriptions disclosed in Girgis teach particles at least 50 nm in size (*id.* at col. 8, line 53), at least 70 nm in size (*id.* at col. 13, line 23), at least 110 nm in size (*id.* at col. 10, line 24), and at least 140 nm in size (*id.* at col. 8, line 65). Nothing in Girgis suggests the specifically recited range of from 10 nm to 35 nm. Thus, Applicants submit that pending claims reciting particle sizes of 10 nm to 35 nm are in allowable form over Bartrug in view of Girgis.

B. Bartrug and Girgis Attempt to Solve Different Problems and Thus Should Not Be Combined

Bartrug is directed towards "a novel method for improving the over-all operating efficiency of a process employing high frequency electric heaters for the purpose of fixing, setting or drying an aqueous coating composition on fibrous material. . . . [It] teaches the advantageous use of soft water as the aqueous component of the coating composition." (Bartrug at column 3, lines 14-20.) As the Office notes, "[t]he resultant strands are free of tack." (Final Office Action at 2; *see also* Bartrug at column 4,

lines 39-44 ("The coated and impregnated strands **5**, as they leave dielectric heater **17**, are free of bubbles and sufficiently dry and free of tack for the purpose of further processing the strand over rolls, pulleys or the like without fear of stripping off coating material . . . .)

In contrast, Girgis is directed towards an "improvement in an aqueous adhesive coating," (Girgis at col. 3, lines 21 to 22) (emphasis added), that achieves "improved flexibility and flexural fatigue resistance" (*id.* at col. 5, lines 14 to 15) (emphasis added). Girgis does not reference "tackiness" whatsoever as a purpose for the invention. Indeed, the Office recognizes this limitation of Girgis by finding a "reasonable expectation of success of forming glass strands having improved flexibility and improved fatigue resistance," considering Bartrug in view of Girgis. (Final Office Action at 4; *id.* at 8 (emphasis added).)

Because Bartrug and Girgis are directed towards different problems, Applicants respectfully submit that the Office improperly combined these two references in making its rejection under 35 U.S.C. § 103(a).

C. Applicants' Claimed Particle Sizes Are "A Matter of Invention"

Applicants additionally submit that the pending claims are not obvious over the combination of Bartrug and Girgis under 35 U.S.C. § 103(a), because the sizes of particles used in the current invention alter the properties of the coated fibers to achieve different results. Applicants found that the 35 nm and 0.5 μm particle sizes impart a significantly lower frictional tension to the coated strands, and also that the 35 nm particles do not open the filament bundle and reduce interfilament bonding. (Spec. at 156-159.).

More specifically, Applicants have found that 35 nm particles reduce the frictional tension of coated fibers to a value of 140 g, with a standard deviation of 21.9 g. (*Id.* at 157, Table 20A.) Accordingly, the 35 nm particles reduce the frictional tension of fibers by at least 160 g (based on a 300 g value for uncoated fibers), and even as much as 181.9 g when accounting for the 21.9 g standard deviation. (*Id.*) Additionally, the specification states that the 35 nm particles in the binder composition do not reduce the interfilament bonding of the filament bundle, and the specification provides data in Figure 14 showing that this aspect was at least observed for pressures below 40 psi. (*See id.* at 158-59.) Similarly, Applicants found that 0.5 µm particles resulted in decreased tackiness or frictional tension, for they observed a decreased frictional tension value of 163 g for fibers coated with these particles. Accordingly, the 0.5 µm particles reduce the frictional tension of fibers by at least 137 g (based on a 300 g value for uncoated fibers), and even as much as 155.1 g when accounting for the 18.1 g standard deviation. (*Id.* at 157, Table 20A.) However, the 0.5 µm particles increased separation between the filaments and thus decreased overall strand integrity. (*Id.* at 159, ¶ 437; *see also* Figure 14.)

As a possible explanation for this observed phenomenon, Applicants hypothesized that larger particles (*i.e.*, 0.5 µm) "spatially separate the filaments, thereby reducing the tack bonding of adjacent filaments by the binder coating," while smaller particles (*i.e.*, 35 nm) "allow sufficient contact between adjacent filaments for tack bonding to occur." (Spec. at 159, ¶ 437.) Accordingly, Applicants found that different particle sizes exert different effects on the properties of coated filaments, such that

the 35 nm and 0.5 μm particles significantly reduce the frictional tension of coated fibers, with the 35 nm particles additionally resulting in increased strand integrity.

By showing that the particle sizes impart different properties to the coated strands, *e.g.*, increased strand integrity versus decreased strand integrity, Applicants have provided evidence of a result different in kind, not just degree, which is directly attributable to the particle dimensions claimed. This finding sets the current facts apart from those of *In re Aller* and *In re Rose* (upon which the Office relies), where there was no evidence that the claimed changes in temperature and concentration for a chemical reaction, or the changes in size and weight of lumbar packages, respectively, resulted in a change of kind, as opposed to just degree. *See In re Aller*, 105 USPQ 233, 235 (C.C.P.A. 1955); *In re Rose*, 105 USPQ 237, 240 (C.C.P.A. 1955). Thus, the Office's assertion that the size of an article, such as the particle size, is not ordinarily a matter of invention cannot stand. *Cf.* MPEP § 2144.04(IV)(A) (citing *Gardner v. TEC Sys., Inc.*, 725 F.2d 1338 (Fed. Cir. 1984) (holding that the claimed device was not patentably distinct from the prior art where the device's "claimed relative dimensions would not perform differently than the prior art device")).

Accordingly, Applicants submit that the pending claims, which recite the 10 nm to 35 nm and 0.5 μm to 10 μm particle size limitations, are now in allowable form.

III. Applicants' Responses to Statements in the Final Office Action

A. Bartrug's Latex Dispersion

The Office states that "applicants' acknowledgement that Bartrug's terpolymer latex dispersed in water necessarily embraces particles is noted." (Final Office Action at 10.) However, the Office has seemingly misunderstood Applicants' position with

respect to Bartrug's latex dispersion. Applicants did not agree with the Office's previous characterization in their Amendment of June 17, 2009. Applicants simply "*acknowledge[d] the Office's position* that Bartrug's terpolymer 'latex dispersed in water necessarily embraces particles.'" (6/17/09 Amendment at 18 (emphasis added).) Applicants still respectfully assert that the Office has failed to adequately support this characterization of Bartrug.

B. Prior Art of Record But Not Relied Upon by the Office

The Office indicates that it did not rely upon U.S. Patent No. 2,754,223 ("Caroselli et al."), U.S. Patent No. 3,377,233 ("Jackson"), and U.S. Patent No. 3,627,601 ("Hayes"), in makings its rejection under 35 U.S.C. § 103(a). (Final Office Action at 13-14.) While these references thus played no part in the Office's rejection, Applicants would like to note that they disagree with the Office's characterizations of these references for at least the following reasons: (1) the Office concludes that the Caroselli disclosure reveals particles that "are effective to reduce tack," but there is no explicit mention of reducing or altering "tack" in the reference, (*see generally* Caroselli), (2) the Office neglects to state that the particles taught in Jackson are only "inorganic" (*see* Jackson at column 1, lines 14-15 and *see generally* all claims), and (3) the only examples of dry lubricants disclosed as particles in Hayes are molybdenum disulfide and graphite (*see, e.g.,* Hayes at column 4, lines 14-15 and column 8, line 18).

III. CONCLUSION

For the foregoing reasons, Bartrug in view of Girgis does not teach or suggest each and every element of the pending claims, or render the pending claims obvious

under 35 U.S.C. 103(a). Applicants therefore submit that the 35 U.S.C. § 103(a) rejection of claims 1, 3, 4, 6-23, and 27-52 in view of Bartrug and Girgis is improper, and should be withdrawn. Applicants therefore request the Office's reconsideration of this application, and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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